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MEDICAL STATISTICS;  
THEIR FORCE AND FALLACIES.

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A LECTURE

DELIVERED IN



PARK-STREET SCHOOL OF MEDICINE,

NOVEMBER 4TH, 1846,

INTRODUCTORY TO THE

COURSE ON THE THEORY AND PRACTICE OF PHYSIC.

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FRASER AND CO., EDINBURGH.

MDCCCXLVII.



# MEDICAL STATISTICS,

&c. &c.

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GENTLEMEN,

IN appearing before you to day, to deliver the Introductory Lecture to the course on the Theory and Practice of Medicine in this School, I purpose calling your attention for a little to a subject of scientific interest, which, although entirely of modern origin in connexion with Medicine, is every day assuming a higher importance in the estimation of the public;—namely, the application of numerical expression to the facts and circumstances of disease—in other words, to Medical Statistics.

In doing this, it is not my intention to enter, at any length, into so varied and comprehensive a subject, which would require a much longer portion of time than is at present at my disposal, but rather by a few simple and striking examples, selected from materials of easy access, to illustrate the interesting nature of the study, and to point out some of those precautions which require to be attended to, in order to guard against error in the conclusions to which it leads.

That the public mind is becoming more seriously impressed with the importance of the subject is, I think,

sufficiently indicated by the frequent and increasing use of such calculations in professional works, especially in those relating to Midwifery and Insanity ; by the publication of several treatises expressly to elucidate the advantages of this mode of reasoning ; but above all, by the attention which has been bestowed upon it by the government of the country, in the periodical preparation of the Census, in the registration of deaths in England, and in the care which has been taken to render these returns subservient to the great purposes of Science by making them illustrate, as far as possible, every question connected with practical Medicine.

During the last session of Parliament, a Committee of the House of Lords was engaged in considering the present state and efficiency of our Irish Dispensaries, with a view to their general improvement. In the resolutions which they reported as the result of their deliberations, one of the principal reasons assigned for uniting the whole of these useful institutions into one uniform and comprehensive scheme for the kingdom, was the facility that such a system would present for the compilation of accurate and authentic returns of the health of the population, an object which they seem fully resolved to carry into effect.

Every one at all acquainted with medical pursuits must be aware of the want of *certainty* that distinguishes them as contrasted with other branches of Science, insomuch that many persons have been led from this circumstance to dispute the right of such studies, however useful in themselves, and however necessary to the happiness of mankind, to enjoy the title of a Science.

This uncertainty might be illustrated in a variety of ways. It is seen in the different effects which the

same medicine produces when the circumstances of its administration are slightly altered—in the success of opposite modes of treatment for the same disease—in the production of different complaints from the application of the same injurious agents—as well as in many other ways that might be mentioned.

It is this circumstance, more than any other, that gives value to *experience* in the treatment of disease. Were it possible to reduce the principles that guide us in the administration of medicines to a set of *fixed* rules, however intricate or however numerous, it would be quite rational to suppose that the youngest member of the profession would be as competent to discharge the duties of his office as the most experienced. All that would be necessary for us to be assured of, would be, that he was perfect master of his business, that he was sufficiently attentive to his duties, and careful enough to avoid mistakes.

It is scarcely possible, I think, to doubt that the generality of the public have some idea of this kind floating on their minds, regarding our profession, and which perhaps is drawn from the practice of the courts of law, where the authorities have laid down distinct rules for the guidance of suitors, and where every step is settled by precedents already established; for we find them continually asking us the question, “Doctor, what is good for such a complaint?” as if it were possible to give an answer that could apply to every case. The reply which I invariably give, when such a query is proposed to me, is, “It depends upon circumstances.” I need not say, I am seldom asked a second time.

As this uncertainty, in connexion with practical medicine, has hitherto baffled every attempt for its removal,



and, in all human probability, must for ever continue to do so, the only resource within our reach to guard against mistake, is to avail ourselves of the most extended fields of observation, so as, by a minute attention to the rarer phenomena of disease, to be able to trace real distinctions between cases apparently similar on the one hand, and actual resemblance between cases apparently different on the other. This it is that constitutes medical experience.

Now, the value of an experienced physician, as thus explained, evidently consists in two distinct things: first, the number of cases he has observed; and second, his skill in determining whether the cases to be compared are strictly similar. The want of either destroys his usefulness as an authority in matters of doubt. The presence of both constitutes him a medical statistician, though it may be unconsciously to himself, and without the use of numbers.

It must, however, be evident, I think, that while it is possible for an amount of conviction to be carried to a physician's mind, sufficient to impress him with the importance of a particular symptom, from past experience, even though he may never have taken notes of his cases, ascertained their number, and recorded them in the form usual with statistical inquirers; yet the conviction cannot, in the nature of things, be by any means so forcible, even to his own mind, as if the vague generality were supplanted by definite numbers. Much less will it be possible to carry that conviction with becoming clearness to the mind of another. If two persons come to us and say, the one, that he has met many cases of a disease, that he has often observed a certain symptom, and that this symptom frequently occurred when the case terminated fatally; and the other can tell us that he has met altogether twenty cases of the disease, that the symptom was present in fourteen of

them, and that every case, where the symptom occurred, terminated fatally ; it will not require, I am sure, much reasoning to shew that the latter statement is infinitely more satisfactory than the former. It owes its value altogether to the use of numbers in expressing medical truths. It not only gives the general result, but it does so with a force exactly proportioned to the facts of the case, and with a clearness that nothing can exceed.

A familiar illustration of this principle may be taken from the examination of the pulse—a matter of every day occurrence in the practice of medicine. The frequency of the circulation is but one of the features that the physician is in the habit of observing ; and a variety of terms are in use to represent the other alternatives that are impressed upon it by disease. The same finger that counts the beats, estimates also the force with which it strikes ; but, while it is possible to represent in numbers, with perfect accuracy, the *rate* of the heart's action from day to day, so that a stranger coming in, who has never seen the case before, can tell in a moment from merely reading the report of the patient's previous state, whether he has suffered any change in this respect, and whether that change is beneficial or otherwise ; it is altogether impossible, owing to the imperfection of language, to represent its other qualities in such a manner as will enable a stranger to do more than form a vague approximation to the state in which it was at the time the report was written.

These considerations, I think, are sufficient to show the important aid that numerical expressions are capable of rendering to the science of Medicine, and if it be true that such advantages follow the use of Statistics, when applied to the practice of individuals, whose limited field of observation must necessarily prevent many important truths

developing themselves, with what force will it apply when brought to bear upon the accumulated experience of the whole profession?

In proceeding to illustrate the interesting nature of Medical Statistics, I purpose selecting the few examples that our limited time will admit of my bringing before your notice, from documents which have been published by responsible authorities, and which are easily accessible, because, although the details themselves may be familiar to many whom I now address, they present advantages over all those which have been collected by private industry, and which render them peculiarly adapted to my present purpose.

In the first place, returns such as those which are annually furnished by the Registrar-General of deaths, in England, from the circumstance of their not being limited to a narrow locality, and of their embracing *all* the deaths that take place within a given time, are obviously free from those inaccuracies which originate in the partial enumeration of a few instead of the whole. Besides, investigations conducted on a scale of such magnitude as that referred to, must obviously be more exact than those which are furnished from smaller numbers. What are commonly called "errors of observation," by which term is to be understood the unintentional return of an individual case under a wrong designation, become of comparatively little importance, because they bear so small a proportion to the general result, and because they have a necessary tendency to neutralize each other; for example, if in the whole returns for England and Wales twenty cases have been erroneously set down as having died of consumption, thus swelling the amount of deaths under that head, to this extent beyond what is just, there is an equal probability,



from the fact of these errors being unintentional, that twenty deaths, really due to consumption, have been actually set down under some other head.

Again, these returns, from the vast extent of country over which they are spread, necessarily require to be furnished by a large number of independent and unconnected observers, who have no possible motive to modify their returns so as to make them bear a particular aspect; and who, if they could have such a motive, are necessarily precluded from the mere circumstance of their separation, from acting in concert so as to produce such a result. Individual writers upon a particular subject, who undertake the task of collecting materials for medical statistics, may have a favorite theory to advance, and by discarding as doubtful, certain cases which seem to bear against their views, and admitting as probable, others which have an opposite tendency, may easily succeed in making up returns to answer their purpose, perhaps without being conscious of having done any violence to the rigid facts that come before them.

But lastly, the circumstance of these returns being repeated annually, gives them a force of authority in deciding matters of doubt that it is quite impossible for them to possess otherwise. For it is much more difficult to believe that disinterested men should continue year after year to falsify the returns designedly, in certain departments, than to suppose that these differences in the relation of diseases to each other, which occur constantly, and in fixed proportions, are the necessary consequences of a natural law regulating their occurrence. But if we suppose that these differences of which I speak are the result of accidental and unintentional mistakes, it is still more difficult to account for their continuing to recur year after year.

The first point to which I shall direct your attention is, the degree in which the two sexes are affected by disease. It is a well known fact that in every country where accurate returns are kept, the number of male infants born annually exceeds by a considerable amount that of the female infants. A glance at the Table drawn up from the Registrar General's Return will show this clearly :—

## BIRTHS, ENGLAND AND WALES.

	MALES.	FEMALES.
R. G. Year ending, June 30, 1838	204,863	194,849
„ „ „ 1839	245,465	235,075
„ „ „ 1840	257,129	244,460
„ „ „ 1841	258,389	246,154
Irish Census—Ten Years 1841	1,275,092	1,221,734

2,240,938    2,142,272

The same might be easily proved by a reference to other documents of the same kind. Yet it is a singular fact that the actual number of the sexes living at any time is exactly reversed, the females preponderating in the population, while the males preponderate at birth :—

	MALES.	FEMALES.
Gen. Population, England, 1841	7,321,875	7,673,633
„ Wales, „	447,533	463,788
„ Scotland „	1,246,427	1,382,530
„ Ireland „	4,019,576	4,155,548

This result can only be produced by a corresponding excess in the mortality of males, which we find actually takes place :—

## DEATHS.

	MALES.	FEMALES.
R. G. . . . . 1838	170,965	164,991
„ . . . . . 1839	169,112	161,895
„ . . . . . 1840	177,926	172,175
„ . . . . . 1841	179,985	175,637
Irish Census—Ten Years 1841	620,865	566,509

*1318,853 1241,207*

But the remarkable point to be attended to is, that this difference of the mortality, which is at once so striking and so uniform, does not occur at the advanced periods of life, or at adult age, when the circumstance might be accounted for by the greater exposure of the male sex to mechanical injuries, the casualties of war, or even the difference of dress, but in the earliest periods of infancy, when the treatment of the sexes is the same; when they are equally exposed to the vicissitudes of the season, when they are clothed in the same manner, and are furnished with the same food:—

## DEATHS UNDER TWO YEARS.

	MALES.	FEMALES.
During the Year . . . 1838	54,188	45,608
„ „ . . . 1839	53,902	44,844
„ „ . . . 1840	58,104	48,066
„ „ . . . 1841	56,703	47,321
Irish Census—Ten Years, 1841	183,787	159,096

*406,684 344,935*

It cannot be accounted for by any idea, that the parents exhibit a greater partiality for infants of the one sex in preference to the other, and hence expend greater care upon their health. Neither is it true that male infants exhibit, on the average, a greater delicacy of frame than

females ; on the contrary, it is notorious, that they are usually larger, and more robust, so much so, that this circumstance has been satisfactorily proved to be the most reasonable cause of the large excess of males, over females, that are still-born.

A reference to the foregoing Table will show that the difference occurs within the first two years of life : indeed, the excess of male deaths under two years of age far exceeds that of all ages, so that there is also a compensating excess of female mortality subsequently.

## DEATHS, R. G.

AGE.	1839.		1840.	
	MALES.	FEMALES.	MALES.	FEMALES.
Under 1 Year,	40,339	31,965	42,800	33,568
1—5	29,407	28,984	33,224	32,195
5—10	7,996	7,720	9,363	9,096
10—15	4,362	4,632	4,556	4,913
15—20	5,424	6,273	5,717	6,628
20—25	6,640	7,097	6,666	7,283
25—30	6,037	6,515	5,931	6,842
30—35	5,396	5,897	5,543	6,077
35—40	5,397	5,659	5,518	5,854
40—45	5,231	5,204	5,308	5,304
45—50	5,471	4,846	5,353	4,924
50—55	5,362	4,904	5,395	4,975
55—60	5,546	4,985	5,370	5,114
60—65	6,834	6,286	6,649	6,489
65—70	6,917	6,576	6,880	6,806
70—75	6,945	7,175	7,308	7,470
75—80	6,676	6,843	6,833	7,371
80—85	4,850	5,268	5,163	5,853
85—90	2,733	3,251	2,799	3,444
90—&c.	980	1,526	1,155	1,753

Whatever causes the difference in the mortality under two years of age, it is easy to understand that when this dangerous period of existence has been passed, the sexes should remain, for some time, similarly conditioned as to



the probability of life. When, however, the period of puberty has arrived, and the peculiar passions and features of the sexes become developed, the hardihood of the one, contrasted with the sensibility of the other, can easily account for the difference that is found to exist.\* Indeed, it will be found that this is the peculiar age at which consumption carries off its victims, and the greater liability of the female to this disease will be established farther on. It is also at this age that the female suffers from the casualties of child-birth. After this epoch has been reached, we find the sexes return for a short time to their former equality, until about the forty-fifth year, from which period until about sixty the males die in greatest proportion, perhaps because they are then most exposed to the anxieties of life, in providing for their families, and putting them forward in the world, and also, perhaps, because having usually a greater strain upon their mental and bodily energies, in the ordinary affairs of life, than the female, the vital forces sooner give way to the collapse, which is the invariable consequence of excessive exertion.

Females constitute the majority of those who die in advanced age; a result which is attributable to their greater temperance, their domestic habits, and their self-control.

But to return to the period of infancy. If we examine in detail, the diseases which are most frequent and fatal at this particular age, as may be done by a glance at the accompanying table, we shall find that there is nothing in the diseases themselves to account for this difference in the mortality of the two sexes. In including Pneumonia in this list, I have to observe, that although it is frequently met with in adult life, yet the mortality of the disease is almost entirely confined to infancy.

\* In favour of the male sex, and which continues until the fortieth year.



			MALES.	FEMALES.
Croup. R. G.	1838		2,410	2,053
	1839		2,223	1,969
	1840		2,135	1,826
	Irish.....		23,349	19,356
Cephalitis. R. G.	1838		1,204	974
	1839		1,279	1,089
	1840		1,057	916
	Irish.....		3,687	2,904
Hydrocephalus. R. G.	1838		4,242	3,430
	1839		4,313	3,436
	1840		3,368	2,835
	Irish.....		5,028	3,969
Convulsions. R. G.	1838		14,549	11,498
	1839		14,245	11,163
	1840		12,689	10,098
	Irish.....		37,825	29,045
Pneumonia. R. G.	1838		9,887	8,112
	1839		10,000	8,151
	1840		8,177	6,629
	Irish.....		16,972	10,712
Teething. R. G.	1838		2,294	2,110
	1839		2,614	2,402
	1840		2,207	2,050
	Irish.....		1,760	1,543

Seeing then, that we can discover no anatomical peculiarity in the structure of the parts concerned, nor any circumstance affecting the habits and external condition of the individuals, and seeing that this remarkable difference, so far as we are able to discover, is constant and uniform ; we are driven to the conclusion that it depends upon some secret but real and fixed law, which the divine Creator, in his infinite wisdom, has appointed to regulate the proper proportion existing between the sexes of our race.

The next point to which I wish to direct your attention is, the relative frequency of consumption in men and women. Authors were for a long time divided upon this question, some maintaining that men were more liable to the disease, others holding the opposite opinion, and some adopting a middle course, saying that the greater proportion of deaths by consumption among females was solely due to the greater numbers of that sex actually living, and that both sexes were liable to it in an equal degree. In determining the matter, each observer, was of course, guided by his own experience, which, was of necessity controlled by the peculiar circumstances in which he practised.

CONSUMPTION.—SIR J. CLARKE.

	MALES.	FEMALES.
Hamburgh, . . . . .	555	445
Rouen Hospital, . . . . .	55	44
Naples, do. . . . .	382	315
New York, . . . . .	1,584	1,370
Geneva, . . . . .	71	62
Berlin, . . . . .	328	292
Sweden . . . . .	2,088	1,860
Do. . . . .	3,054	3,103
Berlin, . . . . .	560	655
Blacks, New York, . . . . .	47	58
Paris. . . . .	2,219	2,970
Do. . . . .	3,965	5,579
M. Louis, . . . . .	57	70
Dr. J. Home, Ed. Infirmary, . . . .	185	112

No one, however, now doubts, since the publication of the Registrar General's return, that even making all due allowance for the preponderance of females in the popula-

tion, the number of deaths by consumption, in that sex, is far greater in the aggregate than that of males.

	MALES.	FEMALES.
General Population, E. and W.	7,668,245	7,885,615
R. G. Deaths by Consumption, 1838,	27,935	31,090
Do. 1839,	28,106	31,453
Do. 1840,	24,519	28,168

80.650 90.001

To account for this remarkable fact, and if possible to correct the catastrophe that carries off whatever is fair and interesting, and amiable in human nature, many striking theories have been put forward. Mr. Farr, the learned and accomplished author of many of those Tables which throw such a value upon the labours of the Registrar General, attributes it to the unnatural practice of tight lacing, by which the figure of the female is deformed; the lungs are compressed into a space totally unequal to their due development, and the natural motions of the chest restrained within very narrow limits.\* And while this is all greatly to be deplored, as being exceedingly prejudicial to health, as well as otherwise objectionable, I think a candid mind can scarcely hesitate to think that this alone is not sufficient to account for the result. For if not, how does it

\* His words are—"The higher mortality of Englishwomen by consumption may be ascribed partly to the indoor life which they lead, and partly to the compression, preventing the expansion of the chest, by costume. In both ways they are deprived of free draughts of vital air, and the altered blood deposits tuberculous matter with a fatal unnatural facility. *Thirty-one thousand and ninety* Englishwomen died in one year of the incurable malady! Will not this impressive fact induce persons of rank and influence to set their countrywomen right in the article of dress, and lead them to abandon a practice which disfigures the body, strangles the chest, produces nervous or other disorders, and has an unquestionable tendency to implant an incurable hectic malady in the frame? Girls have no more need of artificial bones and bandages than boys."—*Letter to the Registrar General from W. Farr, Esq. 2nd Report, p. 73.*

happen that in the other sex, where stays and cinctures may be said to be a thing unknown, where the lungs are allowed to develop themselves naturally, and where the motions of the chest are unrestrained, how does it happen that in them so many cases of consumption occur annually?

Others have attributed it to the confinement within doors, which the female almost invariably practises, either voluntarily, in the discharge of her domestic duties, or involuntarily, as a means of her support. Deprived of exercise and pure air, the development of consumption is, in the opinion of these theorists, but the natural consequence of her violation of the laws which regulate our physical existence.

And others have supposed that it is due to the practice which prevails among females of going about with their chests and shoulders so much exposed, that they take cold more easily than men who are more warmly clad. And in proof of the correctness of their view of the matter, such theorists are in the habit of adducing the fact that the development of tubercle, the essential element of consumption, uniformly takes place in the upper part of the lung, the very situation where it should, *à priori*, be expected to be found, if their theory be correct, because that is the part most constantly exposed.

But not to dwell upon the argument to which I have already hinted, as overturning all these hypotheses, namely—that if any, or all, of these circumstances were the real cause of the greater frequency of consumption in the female than in the male, the disproportion between the sexes ought to be infinitely greater than it actually is; because, while these causes are nearly of universal operation among women, they are entirely absent among men; I would remark, that there is one circumstance connected with this



point that is brought very clearly to light by these returns, and that appears to have escaped the observation of all these writers, which is this—that while the mortality of consumption among the general population, and especially among the inhabitants of *rural* districts, predominates among females, the mortality among the inhabitants of *cities and large towns* is not only relatively, but in most cases absolutely greater in males than females.

		MALES.	FEMALES.
Population—Metropolis, . . .	1837	830,421	960,030
Do. Five Agricultural Counties, ..	"	830,584	893,196
Deaths from Consumption in the Metropolis, half-year } ending December, . . . }	1837	1,369	1,297
Do. in the above Five Counties in the same period, . . . }	"	407	451
Do. in London, . . . . .	1838	4,057	3,630
" " " " " " " " " "	1839	3,749	3,355
Do. in Liverpool, . . . . .	1838	819	823
" " " " " " " " " "	1839	896	866
Do. in Birmingham . . . . .	1838	366	302
" " " " " " " " " "	1839	341	276
Dublin—Ten Years, . . . . .		3,652	3,400

This striking fact, which is easily seen by a reference to these tables, appears to me to throw an additional light upon the nature of this interesting disease, and to suggest another explanation for the differences under consideration.

\* The above represents the absolute mortality from consumption in these towns. The same result is more clearly shewn by the following Table, which represents the ratio, these deaths would have, when reduced to an uniform standard, of a population of 100,000.—See *Reg. General's 2nd Report, Small Ed.* p. 168.

		MALES.	FEMALES.
Leeds . . . . .	1838	440	477
Birmingham . . . . .	"	526	410
London . . . . .	"	451	377
Liverpool and W. Derby ..		595	571
Manchester and Salford ..		549	548
England and Wales ..		378	408



The idea to which I allude is furnished by the belief that consumption is, of all diseases to which the human frame is liable, that which is most intimately connected with the sublimer elements of our nature, namely, our moral and intellectual consciousness. We find it selecting its victims, not from the coarse, unfeeling specimens of iron-hearted humanity, which are, unhappily, to be found in both sexes, but from those that are refined in thought, delicate in feeling, amiable in disposition. It chooses not the sordid, the avaricious, the cruel, but the gentle, the modest, the engaging; and as it lays its unflinching hand upon the unsuspecting objects of its selection, invests them with a still greater loveliness, by throwing into bolder relief those very sensibilities and accomplishments which have made them so susceptible at first. The man who can hear unmoved the reproaches of his fellows, is in no danger of dying from consumption, while, on the other hand, he who is sensitively alive to the opinions of others, who shrinks from the imputation of the ill he has not committed, and who blushes under the consciousness of error, that he regrets, has too great reason to fear, and to guard against the approaches of this fatal malady. The same truth is taught us by a consideration of the age at which its attack is most frequent. Though no period of existence, from the cradle to the grave, is exempt from its ravages, it is peculiarly prone to make its invasion precisely at that epoch in our life when the passions are strongest, and when the sensibilities of our nature require the sympathetic pulses of reciprocated affection. When time has blunted the delicacy of sentiment that characterises the budding bloom of manhood, and the maturity of years has made its possessor comparatively careless of impressions from without, the approaches of this fatal malady cease to be an object of apprehension.

In speaking of consumption thus, I do not mean to deny the influence of other and conspiring causes to produce the result, nor would I insinuate for a moment that moral causes may not bear a most material effect in determining and accelerating the attacks of other diseases.

But how will this idea, even if it be conceded, help us to understand the greater frequency of consumption in females in the country, and in males in cities? Simply thus—I take it for granted, that females, from their peculiar constitution, are the natural and proper victims of a disease so intimately connected with whatever is gentle, and delicate, and refined. Placed by the usages of society as well as by an unwritten law of nature, in the position of receiving the attentions of men, when offered, without the opportunity of soliciting them on their part, they are ever at the mercy of those brutes in human shape, who think it but sport to engage the affections of an innocent girl, and then leave her to eat the bitter fruit of disappointment afterwards. If this be so, the only difficulty is to show, that in cities and large towns, the constitution of the male approximates so closely to the female, as to bring him within the operation of the same causes that develop consumption so commonly in the female. And this, I think, must be readily admitted, when we remember the greater developement of the intellect there, in consequence of the continual excitement to keep pace with rival competitors, the play of passions, the necessary result of the ambition that there so pre-eminently prevails, the frequent disappointments, and the thousand other feelings of a like nature, which tell so commonly and so exclusively upon the male sex.

Time will not permit me to do more than to glance for a moment at those diseases which are presented in the next table, although I think much valuable information would

be afforded by a contemplation of others which are supposed to affect the sexes unequally, but which are found, upon closer examination, to be as common in one as in the other.

		MALES.	FEMALES.
R.G.—Hooping Cough.	1838	4,036	5,071
„ „ „	1839	3,683	4,482
„ „ „	1840	2,275	2,788
Mr. Wilde.....		16,849	19,449
„ Apoplexy.	1838	2,938	2,692
„ „	1839	2,809	2,484
„ „	1840	2,384	2,192
Mr. Wilde.....		7,132	4,053
„ Paralysis.	1838	2,307	2,668
„ „	1839	2,309	2,601
„ „	1840	2,233	2,427
Mr. Wilde.....		4,184	3,022
„ Chorea.	1838	4	20
„ „	1839	23	31
„ „	1840	6	15
„ Delirium Tremens	1838	167	15
„ „ „	1839	184	22
„ „ „	1840	135	13
Mr. Wilde.....		69	8
„ Aneurism.	1838	88	31
„ „	1839	69	33
„ „	1840	73	25
Mr. Wilde.....		63	8
„ Diabetes.	1838	152	55
„ „	1839	151	63
„ „	1840	149	69
Mr. Wilde.....		92	26
„ Carcinoma.	1838	620	1,828
„ „	1839	660	2,031
„ „	1840	648	1,759
Mr. Wilde.....		337	193

The present list, which is not very large, includes all those diseases which present any striking difference in this respect.

The first is, Hooping Cough; a disease occurring at that period of life when, as I have shown, the mortality of the sexes is pretty nearly equal, and which, contrary to what might *à priori* be expected, exhibits a decidedly greater fatality among girls than boys. This difference appears to me to be caused by the tendency which it manifests to develop consumption in persons predisposed to that affection. Death, when it occurs under these circumstances, is set down, by the direction of the Registrar General, to the account of the Hooping Cough, which may be considered as the *primum mobile* of the morbid action. Consumption, thus excited, is apt to run a more rapid course than usual, and to present its ordinary symptoms in a less prominent form. The secondary affection being in a great measure absorbed by the primary, it may hence escape observation altogether in many instances, and the fatal event be set down to Hooping Cough, without any suspicion of the existence of Phthisis having occurred.

It may seem strange at first sight, that the influence of apoplexy and paralysis upon the sexes should appear so uniformly and so exactly opposed to each other. The similarity of their nature—their occurrence in individuals of the same temperament—their connexion with the same pathological phenomena, would all lead us to expect, that wherever the one was predominant, the other should be likewise. Yet, such is not the fact. Apoplexy is most fatal among men; paralysis among women. The solution of the difficulty depends upon the circumstance, that the first is a primary, the latter a secondary lesion of the nervous system. The occurrence of paralysis depends upon



the patient having survived the first shock of the apoplectic seizure. Hence I infer that the Table proves this important point,—that while an equal number of each sex are attacked by apoplexy, a greater number of females survive the seizure ; but as, in most cases, the paralysis remains to a certain extent afterwards, their death is set down to this disease, at whatever period it occurs.

The liability to Aneurism appears to depend partly upon habits of intemperance, and partly upon exposure to external injury. The former cause operates by imparting a highly stimulating property to the current of the circulation, inducing a sort of chronic inflammation in the lining membrane of the blood-vessels, which destroys the elasticity of their coats, and renders them less fit to resist any unusual shocks that they may receive. The latter supplies the occasion which is necessary to give effect to the former. Both these causes are found to co-exist more frequently in men than in women, and hence the greater frequency of the disease in the former.

Cancer—that most melancholy name in the long catalogue of human suffering—strikes with triple frequency the softer sex. How comes it that this bitter draught is served with such unequal liberality to them? It is clear that no mere peculiarity of structure in the organs which are usually the seat of the disease, is sufficient to account for the difference, inasmuch as we find it frequently occurring in organs which are common to both sexes. The very first week that the Workhouse was opened, I examined the bodies of two females, who died a day or two after their admission, and found cancer of the stomach in both. It seems to be generally admitted, that this disease is a constitutional affection rather than a mere local complaint, and that its developement in any particular organ is deter-



mined by accidental circumstances, operating with greater force in one direction now, and in another again.

This view of its intimate nature obliges us to seek for its efficient cause in some circumstance capable of acting upon the system at large, and operating with greater force upon the one sex than the other. Such a cause, I believe, is easily to be found in that state of mental depression, no matter what its origin, which, however carefully concealed, will be always found to precede the development of the disease.

But how, it may be asked, can we explain the production of consumption at one time and of cancer at another from the operation of moral causes of the same kind? Ought not the resulting disease to be invariably the same, if the theory be correct? I answer, that it is quite possible the age of the individual exposed to these injurious influences may have a peculiar effect in modifying the result; for we know that cancer, like consumption, has an epoch in human existence which may be called peculiarly its own. But further, the emotions that produce these diseases, however similar in kind, are yet really distinct. It is *grief* that operates in the one case, *disappointment* in the other. The absence of an object of enjoyment, real or imaginary, is common to them both, but the difference between them lies in this, that in grief the object lost has been already known, and loved, and valued; while in disappointment, on the contrary, the mind has had no experience as yet of what it so ardently desires. Disappointment, too, is invariably attended by grief, but there may be grief when there is no disappointment.

In proceeding to call your attention for a moment to this Table, compiled from the Statistical Reports on the Sickness and Mortality of the British Army, drawn up by

Major Tulloch, and presented to Parliament, I wish to say a word or two on the extreme value of such reports, not only to members of our profession, but also to the country at large.

To the physician they are invaluable, because they afford him, upon an extensive scale, a series of observations, which it is impossible for him to obtain otherwise, and which throw an amazing light upon the intricate subject of Climate, as it affects the human constitution—a subject regarding which, notwithstanding all the attention hitherto bestowed upon it, much remains to be ascertained. This will be immediately admitted when we remember that our brave soldiers are scattered over every part of the habitable globe, and that consequently they are exposed, from the nature of their duties, to every variety of climate with which we are acquainted.

The fact that the troops to which these Reports refer, are taken from among ourselves, gives them additional value in a practical point of view, because the results that they exhibit are not mixed up with any of those counteracting influences which difference of race and diversity of physical conformation are apt to induce, but are simply the effect of climate properly so called. If a physician in England wishes to send a patient labouring under rheumatism to a congenial climate, he has only to refer to these Tables to ascertain how the British troops have been affected in different countries, and to select a residence in a locality which experience has proved to be the best adapted for that complaint. And so of other diseases. The force of this depends upon the circumstance that his patient and the troops are of the same race. If, on the other hand, his patient were of foreign extraction, it is quite clear that such a conclusion would not be warranted by the premises.

Soldiers, from a variety of circumstances, are peculiarly fitted to be made the subject of scientific investigations of this kind. They are in particular a select body of men, of sound constitution, as far as a strict medical examination can determine, and in the prime of life. They are all subject to the same discipline, are well supplied with the necessaries of life, and are not exposed, except upon rare occasions, to severe or protracted duties. Then, again, they are all placed under strict medical surveillance, where the earliest symptoms of disease can be detected, and when, even after sickness shall have been removed, the various steps of convalescence, however tedious, can be carefully noted. And lastly, they are placed under an authority invested with the power to remove whatever appears injurious to them in their food, residence, or mode of life, so that a sort of *experimentum crucis* can be instituted of the most satisfactory kind, to discover and eliminate the noxious element, whatever that may be. Of this there is an instance given in these Reports, where by the introduction of an increased quantity of fresh meat issued to the soldier in his rations, in lieu of the salt meat previously allowed to him, a most remarkable diminution in the sickness and mortality at some of the stations immediately ensued. These things necessarily lead us to infer that medical officers of the army possess opportunities of studying what is called the Natural History of Disease, in a degree that civil practitioners can never enjoy.

So much for their value as mere scientific records. Their importance to the country depends upon the fact that every soldier, in his original outfit, including the cost of his support during the time he is drilled, and before he has become available for military operations, is a source of heavy expense. And his subsequent maintenance, though not

equal to the former, is still considerable. Every thing, therefore, that impairs the efficiency of the army, as sickness manifestly does, or shortens the period of service that a soldier is able to perform, increases the expense to the nation, by obliging it to keep up a larger number of troops than would otherwise be necessary. The great problem to be solved, in reference to this matter is, how to obtain the most efficient available force at the smallest possible expense. Whatever contributes to promote the health of the troops will obviously have this effect; and these reports, by directing attention to the unhealthy stations, and elucidating the causes of that unhealthiness by comparison with other places, must materially assist in producing this effect.

	Average Mor- tality, per 10,000.	Average Sickness by Fever, per 10,000.	Average Sickness by Diseases of Lungs.	Average Sickness by Consumption.	Average Sickness by Disease of Liver.	Average Sickness by Disease of Sto- mach and Bowels.	Average Sickness by Disease of Brain.
West Indies, . . .	369	7,170	1,150	118	220	4,210	280
Jamaica, . . . .	1,019	9,100	850	129	120	2,380	140
Great Britain, . . .	140	750	1,480	63	80	940	60
Gibraltar, . . . .	214	1,610	1,410	63	130	1,860	60
Malta, . . . . .	163	1,730	1,200	57	210	1,550	60
Ionian Isles, . . .	252	4,570	900	48	170	1,560	100
Bermuda, . . . . .	288	1,360	1,260	88	140	4,150	170
Canada, . . . . .	161	2,140	1,480	65	80	1,550	140
Nova Scotia, . . .	147	690	1,250	72	90	940	110
Sierra Leone, . . .	4,830	14,110	560	40	820	5,040	180
St. Helena, . . . .	254	740	610	40	290	2,680	70
Cape, . . . . .	137	880	980	55	250	1,260	100
Mauritius, . . . .	274	1 540	840	76	820	2,750	410

Time will not permit me to do more than glance at one point in connexion with this Table, and that is, the light it throws upon the nature of consumption. The disease is commonly supposed to be much more frequent in these



countries, which are cold and damp, than in others of an opposite climate. Indeed, so general is this opinion, that on the Continent of Europe it is significantly designated as the "English Disease," as if to intimate its greater frequency with us than among our Continental neighbours. But the accuracy of this opinion, like many others which are taken up on mere surmise, may well be questioned, at least until plain numerical statements, carefully prepared, can be produced to support them. As it is, the evidence of this Table goes to show, that the influence of climate on the British race, in producing consumption, is exactly the reverse of what has been supposed. Taking the average number of cases occurring in Great Britain as the standard of comparison\* it will be found that the standard is exceeded in Bermuda, Jamaica, the West Indies, and the Mauritius; countries distinguished pre-eminently for their warm temperature, and the equability of the range of the thermometer. They are not subject to those sudden and extreme alternations from heat to cold that prevail in temperate climates, and which are supposed to be so prejudicial to persons of a delicate constitution. And while the Table proves that a considerably larger number of cases occur in these countries, it may fairly be presumed, that it does not indicate fully the tendency to develope that complaint that they really possess. Because, wherever the general mortality is high, as it is there, from malignant fevers, fewer cases of consumption occur in proportion to what would otherwise be met with, because a great many

\* There must be something peculiarly affecting soldiers to induce this high rate of mortality from consumption in England 63 in 10,000; for the rate of males, as laid down in the Registrar General's second report is only 37 in 10,000 for the general population, which is the more remarkable, as soldiers must be regarded as a select body of men. An examination into the causes producing this remarkable result would go far to corroborate the opinion put forward in this Lecture, of the strong influence of moral causes in determining the attack of consumption.



delicate persons are carried off by the more rapid and fatal disorder, that would otherwise remain for the slower inroads of consumption.

The places, on the other hand, where the average annual number of cases is less than in Great Britain are, Malta, the Ionian Islands, Canada, St. Helena, the Cape, and Sierra Leone.

As to Malta, though the returns for twenty years show the average amount so low as 57 per 10,000, the returns for the last seven years, which may reasonably be supposed to be the more accurate of the two, give as the result, an amount of 67 per 10,000, showing a liability to it fully as great as prevails at home. And here I find it necessary to make two observations—consumption is a disease of comparatively slow growth, whose existence cannot be positively asserted in any instance until the development of physical signs of tubercular disorganization in the lungs, which necessarily occur at a late period. It may hence naturally happen often, especially in colonies not very far away, that invalids, really labouring under consumption, are sent home for change of air, who ultimately die of the disease, but whose complaint not having fully developed itself during their stay in the colony, is entered by a different name in the returns. Such a result is not likely to occur in garrisons in this country, because in the nature of things they remain for a longer time under treatment, so that the necessary evidence is obtained to designate the disease properly. Hence it may be very fairly concluded, that the returns show the maximum result for Great Britain, and the minimum for the colonies.

The second point to be attended to is, that in estimating the value of these returns in reference to consumption, a regard must be had to the average age of the soldiers

at each station, for it can be shown, that the liability to consumption is greater in the earlier years of adult life, than at more advanced age. Now it happens that in some garrisons the troops are habitually older than in others, from the proportion of recruits being much greater in the latter. Thus, in Great Britain, and in North America, to which country regiments are sent direct from home, the proportion of young men is much larger than in the stations of the Mediterranean, to which they are transferred after a residence of some years in the West Indies. The natural result of this is to increase the apparent tendency to consumption in the former, and to diminish it in the latter.

As to Sierra Leone, the small amount of consumption there is to be explained on the principle of the excessive mortality of fever, masking almost entirely the natural tendency to other diseases.

The Ionian Islands, from their proximity to the lofty mountains of Albania, whose elevated summits are covered with snow for six or seven months in the year, have not a climate that can be considered by any means warm, and besides are as subject to sudden vicissitudes of temperature as the British Isles.

The same remark may be made of the Cape of Good Hope, whose position within the tropics would naturally lead us to classify it among the warm climates; and although the quantity of rain that falls in the south coast of Africa is remarkably small, yet in the immediate vicinity of the settlement this exemption from wet and damp does not hold, the moisture of the marine breezes being attracted and condensed by the mountains at the Cape,\* so that

\* The average fall of rain at the Cape is 41 inches (Tulloch), while that of Great Britain is about 30—varying from 20 inches, in some districts to 60, in the mountainous regions.—*Encyclop. Edinensis*.

neither this last situation, nor the Ionian Islands, can properly be quoted as examples of that form of climate which is supposed to be beneficial to persons predisposed to consumption.

St. Helena is another instance of the popular errors which prevail respecting this disease. It is not, it is true, either a cold or a damp country, yet owing to its peculiar formation it ought, according to ordinary impressions, to be highly unfavourable to persons with delicate lungs. It possesses, strictly speaking, two climates—a tropical, and a temperate one, separated from each other by a mere difference of elevation. A few minutes' time is sufficient to transport the soldier from one to the other. And this alternation he is continually obliged to undergo in the performance of his ordinary duties; yet the change of temperature from extreme heat to decided cold, attended as it is by the fatigue of the ascent, and the difference of atmospheric pressure on the delicate structure of the lungs, is not found to be productive of injury to the soldier, or the civil inhabitant.

## CONSUMPTION IN LONDON.

YEAR.	POPULATION WITH- IN THE BILLS.	YEARS.	AVERAGE DEATHS.	
			FROM ALL DIS- EASES.	FROM CON- SUMPTION.
1700	665,200	1700—10	20,943	3,055
1750	653,900	1750—60	20,349	4,373
1801	777,000	1800—10	18,890	4,979
1811	888,000	1810—20	19,061	5,491
1821	1,050,500	1820—30	20,679	6,552

The foregoing Table is copied from Marshall's Work on "The Statistics and Mortality of London," and is a clear proof of the extreme value of these researches,

when continued for a sufficient length of time. It is a statement of the comparative mortality in that city at stated periods, from 1700 to 1830, and the result of the comparison must be most gratifying to every philanthropic mind, as showing the immense improvement that must have taken place in the general health of the metropolis within that interval. For while the gross population has nearly doubled, the entire number of deaths occurring annually is actually less than it was at first.

But the ostensible object of the Table is, to answer the question that is frequently asked, and which is undoubtedly an important one,—Is consumption increasing? And this it certainly asserts. But then, it must be observed that the increase is so trifling, as compared with the corresponding increase of the population, as to amount, in fact, to an assurance, that it really has undergone very little change in the long interval of one hundred and thirty years. This is the more convincing when we remember, that owing to modern improvements in the diagnosis of disease, many cases of consumption are detected now, that would formerly have escaped notice, or been called by an improper name, so that we may fairly conclude, that many cases have been omitted from the earlier records that ought properly to have been inserted in them, and that, so far as the evidence of this table has any weight, it tends rather to induce us to believe that even such a fatal disease as consumption has shared the general improvement that is manifest in other departments of Medicine, and has become a less formidable foe to the human race.

But I hasten to say a few words on the fallacies connected with statistical investigations, and which should never be lost sight of, as exercising an important influence on the conclusions to which it leads.



It is an admitted axiom, in such researches, that the larger the numbers they embrace, the less liable they are to error. Hence, returns for an entire kingdom possess a force that no local or limited ones can do. Yet it is often necessary, for scientific purposes, to compare the returns from one portion of a kingdom with another, or from two public institutions. But the greatest care should be taken to ascertain that the institutions, thus compared, should be exactly similar. Thus, to contrast the mortality in one of our workhouses with that of an hospital, would be incorrect, not merely because of the different classes they receive, but still more so, because the mode of admission is different. In the workhouse, no one labouring under disease and poverty, however hopeless his case, is rejected; but in the hospital, the physician or surgeon examines every applicant before admission, and rejects those whom he considers unsuitable.

I have been told by the resident clinical clerk of one of our largest hospitals, that the instructions relative to the admission of patients, he received on obtaining his appointment, were, that before signing an order for the admission of a patient, he should ask himself this question—"Can I cure his disease?" and if not, he was to be rejected. Now, while a great deal may be said in favour of rejecting incurable cases, on the ground that they occupy accommodation that might be more usefully employed in giving relief to others, especially now that the workhouses are open, it must be clear that the practice is capable of abuse, and that the unworthy motive of promoting personal reputation, trumpeted forth as it often is, in the public reports of hospitals, under the convincing form of a large number of recoveries, and a small number of deaths, may occasionally operate to cause the rejection of some patients, capable of

receiving temporary relief, or otherwise suitable for admission.

I can myself testify that it is a common practice for patients to be sent into the workhouses shortly before death, who have been treated previously in the hospitals, and who remain there up to the very day of their removal to the workhouse. This last summer, a case of gangrene of the lungs was thus translated, two days before her death; and I need not say, that when such a disease is sent out of hospital, to die in a workhouse, it is scarcely to be doubted that many cases of consumption and other lingering ailments are similarly disposed of.

Even two institutions, apparently similar, are often so differently circumstanced in their general arrangement and mode of management, as to be thereby rendered unfit for comparison with each other. The two Dublin workhouses, little as it may be thought, exhibit differences in the diet, clothing, and admission of the inmates, as well as in the internal economy of the house, that could scarcely be expected in two establishments of the same kind, in the same city, and under the same supreme authority. From a difference in the mode of drawing up the returns immediately after they were first opened, very unfair conclusions were drawn as to the relative merit of the two institutions, that were by no means warranted by the actual facts of the case.

To pass to another subject.

It is well known that in no department of medicine has the principle of statistics been more generally applied than in Midwifery, and we can point to our own city as bearing the palm in scientific devotion to it. The increased safety with which mothers and children pass through the trying ordeal can be clearly proved, and our various Lying-in-

Hospitals are accustomed to appeal to their numerical records in proof of the skill of their respective medical attendants. Yet, it may be fairly questioned, I conceive, whether such extreme attention to numerical returns has not a natural tendency, on the part of those immediately concerned, to hurry patients out of hospital as soon as possible after the immediate risk of the crisis has been surmounted, rather than allow them to remain a longer period, with the possible contingency of some of the secondary dangers attending this state developing themselves. In the year 1835, I was resident clinical clerk at the House of Industry, in charge of the Hardwicke and Whitworth Hospitals, having the privilege of admitting the patients as part of the duties of my office. When in that situation, I received a letter from the master of one of our Lying-in Hospitals, requesting admission for a woman who had recently been confined, and who was represented as labouring under fever. Judge of my surprise, on her arrival, to find that the fever with which she was afflicted was the hectic of consumption.

An application of the principle of medical statistics, which has been recently proposed and advocated by members of our profession, who hold the highest rank in public estimation, is to test the value of certain modes of treatment, as contrasted with others. A number of cases of a disease, say delirium tremens, are treated in a particular way, and the result is compared with an equal number of cases treated differently, and a conclusion is drawn in favour of the plan which appears to secure the largest number of recoveries out of the entire. To this theory, as thus explained, there are many objections. Let us suppose, however, that the trial has been made; to what practical result, I ask, can it possibly lead? Are we to understand that

having found out a certain plan of treatment to be successful in a large majority of cases of any disease, that it is to be applied, with unbending exactness, to every other example of it we may meet with? Is there to be no regard to the stage of the disease, the constitution of the patient, the character of the prevailing epidemic? If there is, of what value is the supposed statistical announcement, to guide us in the varying circumstances in which we may be placed? If such distinctions are disregarded, in what respect is our conduct less absurd than that of the mere pretender to physic, who, with a boldness equalled only by the credulity of the public, invents his specific, and declares that it is a panacea for all diseases—that it is suited to all constitutions, and that while it will infallibly cure, it can certainly do no harm. Every educated man can see at once that such an assertion proves too much; but wherein does the practitioner differ, who treats diseases by routine, and having ascertained the name of the complaint under which his patient labours, immediately proceeds to effect its removal by one unvarying plan? Independently of the modification that ought to be made in our treatment by a consideration of the stage of the disease, the age, strength, and constitution of the patient, there is an equally important one to be observed, arising from changes in the innate nature of the disease itself, presenting at one time a malignant, at another a mild aspect. This, which has been denominated by Sydenham, the Epidemic Constitution of the year, and which varies, without appreciable cause, from time to time, is a subject involved in much obscurity; but of the reality of which there cannot be the slightest doubt.

The Indian cholera made two distinct attacks in almost every place which it visited, during its former fearful pre-



valence. In both instances the earliest cases were exceedingly fatal, the latter ones, comparatively favourable. At first it was thought that this result was to be accounted for by the ignorance of the physicians, who had no previous opportunity of learning the proper treatment: as they became familiar with its nature, their practice was more successful. But the fallacy of this conclusion was shewn by the same phenomenon being observed on its return in the subsequent year. The real explanation is, that the violence of the disease abated after the first outbreak.

The same thing has been often observed of scarlatina. Every one remembers with what alarm its late attacks in this city were regarded, from the destructive ravages it produced. Some houses were nearly emptied of their inhabitants. The hopes of many an interesting family were blighted for ever, by the sudden removal of their younger branches. Yet it is not so long ago when this same disease was uniformly so mild as to require scarcely any medical interference. When I was a student, attending the Clinical instructions of the late Dr. John Crampton, at Sir P. Dun's Hospital, I saw a large number of cases, yet all of them did well. Few of the patients were confined to bed more than two or three days, and none of them presented symptoms of danger. Similar was the character of the disease in the days of Sydenham, who was so impressed with the mildness of its nature, that he ventured to assert it was never dangerous except from the injudicious interference of the physician. "*Ex nimia medici diligentia.*"

It is quite evident, I think, from this, that it is impossible to draw from *mere* statistical statements any rational rules for the treatment of disease. If the same malady requires at one time bleeding and antimonials, and at an-

other wine and bark, something more is requisite to direct us than a bare enumeration of how often the one plan has succeeded, and how often the other.

To have the facts recorded is doubtless of immense importance, though not for this particular object, as affording a reasonable prospect, at some future period, that there will arise a master-mind of giant grasp, who, having the accumulated materials of previous ages before him, will be able to do for medicine, what Copernicus and Galileo did for astronomy, and out of the mass of confused, and apparently contradictory observations, reduce a simple and beautiful law to explain the whole, at once satisfactory to the reason of the intelligent creature, and worthy of that Divine mind that presides over, and regulates the universe.

To show the fallacy of such reasonings, when applied to the treatment of disease, I may mention an anecdote that I heard some years ago, relative to the fever hospital of this city. Three of the physicians agreed to treat their patients, each upon a separate plan. One adopted the antiphlogistic, another a stimulating, and the third an eclectic mode of treatment. On coming to compare the results, it was found, to their surprise, that their success, notwithstanding the difference in their mode of management, was singularly similar.

The first impression which such a statement leaves upon the mind is, that medicine is useless, and that the recovery of the patient is due to a natural effort rather than the skill of the physician. But before admitting such a conclusion, we must be informed whether the cases, strictly speaking, were similar in their symptoms and severity, and the results equal in other respects, as well as in the proportion of recoveries. It is quite possible that the ratio

of mortality may be the same under various modes of treatment, and yet the value of each may be very different. One set of patients may recover sooner than another, and the exhaustion of constitution, consequent upon the attack, may be less under one system than under another. Again, the liability to relapse, and the risk of organic injury succeeding the disease, may vary greatly in different hands. It is obvious, therefore, that no argument can be based upon such assertions as this, against the value of scientific medicine, while so many other important particulars remain to be taken into account.

Last winter, the official authority of one of our public hospitals, annoyed at the quantity of extras ordered by some of the physicians, called together the entire number in attendance, amounting to four, to show them a detailed statement of their expenses, and to read them a lecture on their extravagance. Having done so, he went on to say, "Now, gentlemen, would you like to know your success," and immediately produced the black list of fatal cases for each, made out separately. It was found that those who ordered fewest extras had the smallest number of deaths; of the other two, one I am informed was exceedingly annoyed, and something having been said in a joke, about publishing the comparison, got extremely angry and threatened him if he attempted it. The fourth, whose professional reputation might well set every statement of the kind at defiance, with great good sense observed, that so far from thinking it any imputation against his skill, he looked upon it as the highest proof of the public estimation in which he was held; as the poor, whenever their ailments assumed a serious aspect, wished to have themselves placed under his care, and hence the greater fatality, as well as the heavier expense of his cases.

But time warns me to conclude. I can only allude to one other illustration of the fallacies attendant upon medical statistics. Most of you may probably recollect an investigation into the mortality of the infant children in the North Dublin Workhouse, that took place about five years ago in this city. It is not my intention to allude to the subject farther than to notice one or two erroneous conclusions that were brought forward in the progress of the controversy.

Dr. Willis, one of the Guardians, having observed in the course of the discussion that there was no standard of infant mortality in existence for the poorer classes outside the workhouse, to which reference could be made, set himself about the laborious task of compiling one from personal investigation. The labour and the painstaking perseverance which he displayed in prosecuting his undertaking, are worthy of the highest praise, and the little volume which he has published is one of the most valuable additions to our city statistics that we possess. It contains many valuable suggestions that deserve the serious consideration of the proper authorities. The result of his investigation was, that the mortality of infants in the lowest classes of society, outside the workhouse, was fully as great as that within its walls, and hence he inferred that the latter was not excessive.\* But the term *excessive*, it must be remembered, is a relative one; that rate of mortality which is moderate in certain circumstances, may be

\* His words are—"The result of a minute and careful examination of the facts ascertained in the course of this inquiry, convinced me that the alleged excessive mortality stated to exist among the children, was very much exaggerated; and that the deaths among them was not greater than the same class furnished outside the workhouse, and not more than might be expected from the state of destitution and wretchedness in which the mothers of the infants were sunk when seeking admission.—*Facts connected with the Social and Sanatory Condition of the Working Classes in the City of Dublin*, by Thomas Willis, F.S.S. p. 9.



excessive in others. If Dr. Willis's statement be true, it may be asked, *cui bono* the workhouse? To what purpose are we taxed, if the poor, with the advantages of food, clothing, and comfortable residences, provided at the public expense, are as sickly, and die in the same numbers as when they are starving in their cellars, or wander through our streets with scarcely a rag to cover them, and without a place of shelter?

But there was a second fallacy in Dr. Willis's calculation, as well as in some others that were brought forward on that occasion, which was this. A certain number of families having been selected for the purpose, the gross number of children born in them was ascertained, and then the number who had died before they reached their second year. The result was said to give the rate of mortality under two years of age. But in speaking of a rate of mortality, a reference is always made to a certain definite interval of time. For convenience sake, every one is in the habit of selecting a year as the proper period for this purpose: and this was in fact the interval used in calculating the rate of mortality in the workhouse. But it is quite obvious that in Dr. Willis's calculations, the interval, from the very nature of things, was two years and not one. From the difference in the rate of mortality, in the first and second years of infant life, it is a complicated problem to determine exactly the ratio for a class consisting of infants of both ages; but it is quite evident that until this is done the two calculations are altogether incapable of comparison.

Gentlemen, I have done. I might extend these observations further, but I feel I have already trespassed too far upon your patience. If I have succeeded in any imperfect degree in exhibiting the extreme interest and im-

portance of these researches on the one hand, and the necessity of becoming cautious in prosecuting them on the other, the object I have had in view has been sufficiently answered.

May I not ask that if the study of geology, despite its other advantages, has derived its chief attraction from the deeply speculative character of its researches, calling forth the varied faculties of our minds, both intellectual and imaginative, as each new discovery in the world of matter confirms the favorite theory we have cherished, or crushes it to nothing, is there not here as fair a field for mental speculation as any the geologist has ever trod upon? Nor is it speculation merely. It floats no idle vision on an empty brain. Every new discovery here is fraught with permanent advantage to our race. The truths of geology have indeed a most important bearing upon the wealth, as well as the comfort of the human family. By them the arts have been sustained, commerce has been quickened, the bonds of mutual dependence in which the world has been held have been multiplied and strengthened. But what can adequately express the value of human life? What is worthy to be compared with a knowledge of the means of preserving health? Every thing that can contribute to this end is worthy of attention, and a nation's best energies, as well as an individual's highest attainments, are worthily employed when devoted to such an object.

THE END.